

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB2004/002223

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G01R33/3875

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data, IBM-TDB, COMPENDEX, INSPEC, BIOSIS, EMBASE, MEDLINE

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|------------|---|-----------------------|
| X          | <p>SHEN J ET AL: "IMPROVEMENTS ON AN IN VIVO AUTOMATIC SHIMMING METHOD (FASTERMAP)" MAGNETIC RESONANCE IN MEDICINE, ACADEMIC PRESS, DULUTH, MN, US, vol. 38, no. 5, 1 November 1997 (1997-11-01), pages 834-839, XP000741762 ISSN: 0740-3194 Sections "Introduction", "Methods", "Discussion" figures 1,3</p> <p style="text-align: center;">-----<br/>-/--</p> | 1,2,4-6, 9-17, 19-24  |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the International filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the International filing date but later than the priority date claimed

- \*T\* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \* & \* document member of the same patent family

Date of the actual completion of the International search

15 October 2004

Date of mailing of the International search report

03/11/2004

Name and mailing address of the ISA

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.         |
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| X          | <p>SHEN J ET AL: "Linear projection method for automatic slice shimming"<br/>MAGNETIC RESONANCE IN MEDICINE, ACADEMIC PRESS, DULUTH, MN, US,<br/>vol. 42, 1999, pages 1082-1088,<br/>XP002294863<br/>Page 1082, left-hand column, sections "Methods", "Discussion"</p>   | 1,2,4-6,<br>9-17,<br>19-24    |
| X          | <p>WEBB P ET AL: "RAPID, FULLY AUTOMATIC, ARBITRARY-VOLUME IN VIVO SHIMMING"<br/>MAGNETIC RESONANCE IN MEDICINE, ACADEMIC PRESS, DULUTH, MN, US,<br/>vol. 20, no. 1, 1 July 1991 (1991-07-01),<br/>pages 113-122, XP000219240<br/>ISSN: 0740-3194<br/>Sections "Field mapping pulse sequence", "Determinatoin of shim currents"<br/>figure 1</p> | 1,3,5-7,<br>9,16,17,<br>20-23 |
| X          | <p>GRUETTER R ET AL: "FAST, NONITERATIVE SHIMMING OF SPATIALLY LOCALIZED SIGNALS. IN VIVO ANALYSIS OF THE MAGNETIC FIELD ALONG AXES"<br/>JOURNAL OF MAGNETIC RESONANCE, ACADEMIC PRESS, ORLANDO, FL, US,<br/>vol. 96, no. 2,<br/>1 February 1992 (1992-02-01), pages 323-334, XP000261723<br/>ISSN: 1090-7807<br/>the whole document</p>         | 1,2,4-6,<br>9-17,<br>19-24    |
| A          | <p>GRUETTER R, TKAC I: "Field mapping without reference scan using asymmetric echo-planar acquisitions"<br/>MAGNETIC RESONANCE IN MEDICINE, ACADEMIC PRESS, DULUTH, MN, US,<br/>vol. 43, 2000, pages 319-323, XP002294864<br/>Sections "Materials and Methods", "Results and Discussion"<br/>figure 1</p>  | 1-6,9-24                      |
| A          | <p>SHEN J: "Effect of degenerate spherical harmonics and a method of automatic shimming of oblique slices"<br/>NMR IN BIOMEDICINE, JOHN WILEY &amp; SONS,<br/>vol. 14, 2001, pages 177-183, XP009035893<br/>the whole document</p>   | 1-6,9-24                      |

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| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|------------|---|-----------------------|
| X          | <p>SHOICHI KANAYAMA ET AL: "IN VIVO RAPID MAGNETIC FIELD MEASUREMENT AND SHIMMING USING SINGLE SCAN DIFFERENTIAL PHASE MAPPING"</p> <p>MAGNETIC RESONANCE IN MEDICINE, ACADEMIC PRESS, DULUTH, MN, US, vol. 36, no. 4, 1 October 1996 (1996-10-01), pages 637-642, XP000629277</p> <p>ISSN: 0740-3194</p> <p>Sections "Introduction", "Method", "Conclusions"</p> <p>figure 1</p> | 1-6, 8, 16-23         |
| A          | <p>EP 0 949 512 A (PICKER INT INC)</p> <p>13 October 1999 (1999-10-13)</p> <p>the whole document</p>  | 1-24                  |
| A          | <p>SCHNEIDER E ET AL: "RAPID IN VIVO PROTON SHIMMING"</p> <p>MAGNETIC RESONANCE IN MEDICINE, ACADEMIC PRESS, DULUTH, MN, US, vol. 18, no. 2, 1 April 1991 (1991-04-01), pages 335-347, XP000209846</p> <p>ISSN: 0740-3194</p> <p>the whole document</p>   | 1-24                  |
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| A          | <p>SCHÄR M ET AL: "Considerations on shimming for cardiac applications at 1.5 and 3.0 T"</p> <p>PROCEEDINGS OF THE INTERNATIONAL SOCIETY FOR MAGNETIC RESONANCE IN MEDICINE, 11TH SCIENTIFIC MEETING, TORONTO, ONTARIO, CANADA, 10-16 JULY 2003, 10 July 2003 (2003-07-10), page 174, XP002294865</p> <p>the whole document</p>   | 1-24                  |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IB2004/002223

| Patent document<br>cited in search report |   | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
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